Asthma Management and Educators Course

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Epidemiology

- Asthma is the third leading cause of preventable hospitalizations in the United States*
- Most common chronic disorder in pediatric population
- Hospitalizations for asthma can be prevented

* Pappas et al. *Am J Public Health*. 1997;87:811-816.

Epidemiology (cont)

Annually accounts for

- 13.9 million outpatient visits for asthma to private physicians' offices*
- 2 million ED visits†
- Approximately 500,000 hospitalizations†
- Approximately 5,000 deaths†

*American Lung Association, Epidemiology and Statistics Unit. *Trends in Asthma Morbidity and Mortality*; February 2002.

†CDC. *MMWR Surveill Summ*. 2002;51(SS01):1-13.

Epidemiology (cont)

- 5 million children in the U.S
- 17% of the pediatric population
- 50% higher prevalence rate in boys
- 26% higher rate in African-American
- 12% greater prevalence in poor

Epidemiology (cont)

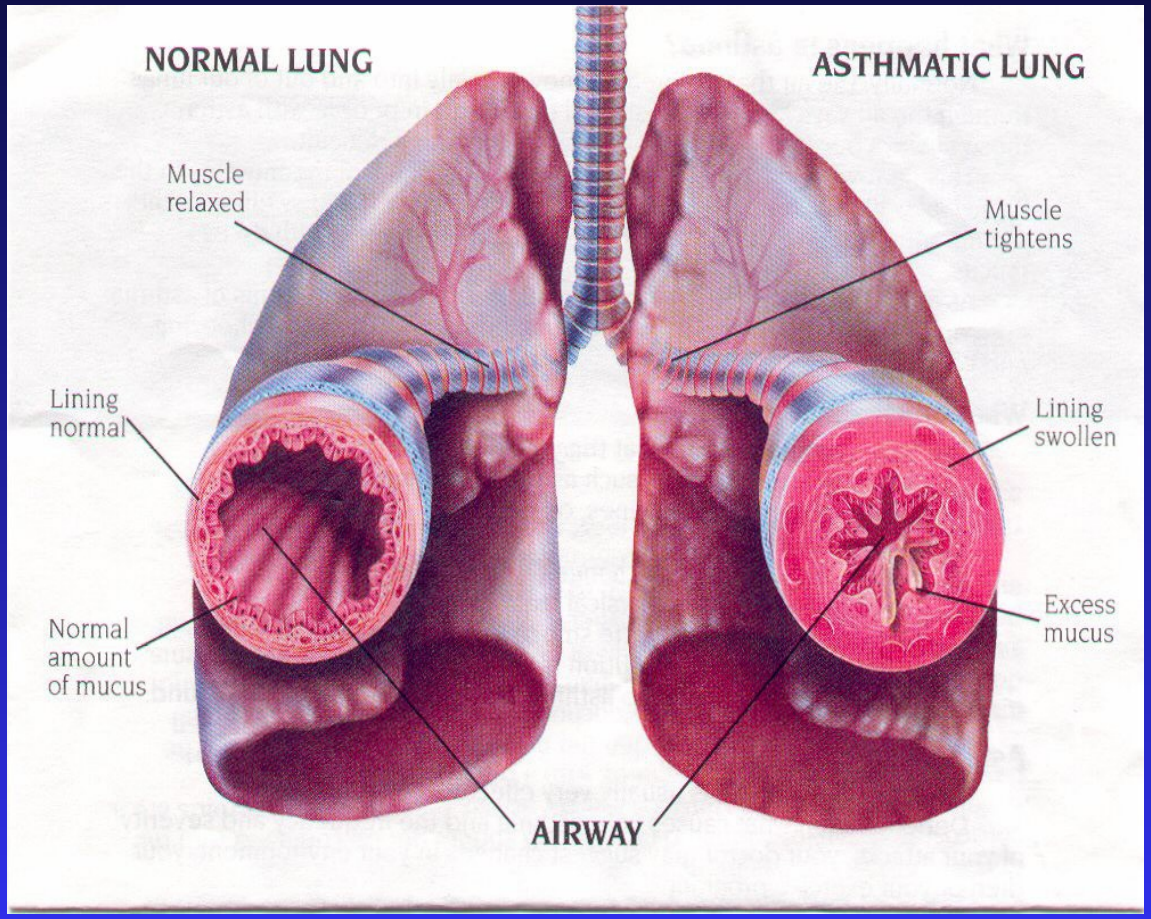
Centers for Disease Control & Prevention

- Approximately 9.6% of the population – nearly 26.7 million adults & children
- 4%-5% of the population is affected w/ asthma at any given time
- 6% of children have had an asthma attack in the last 12 months

Financial Costs

- In 1998, asthma-related expenditures accounted for $12.7 billion in the U.S.
- Perspective: With the money spent on asthma, the nation could purchase 2 to 3 Nimitz-class aircraft carriers *every year*

WHAT IS ASTHMA?



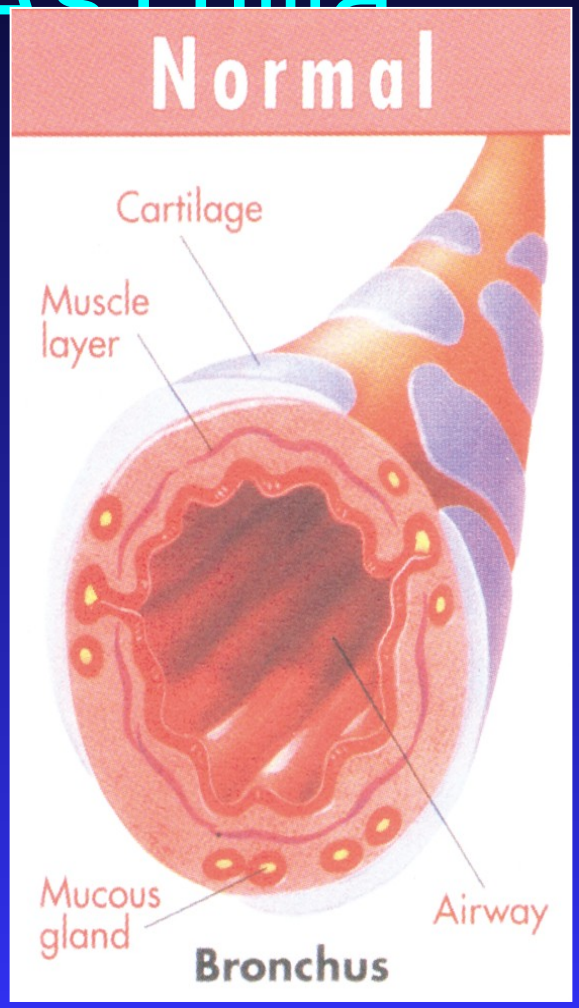
Asthma and Allergy Foundation of Americ

Definition

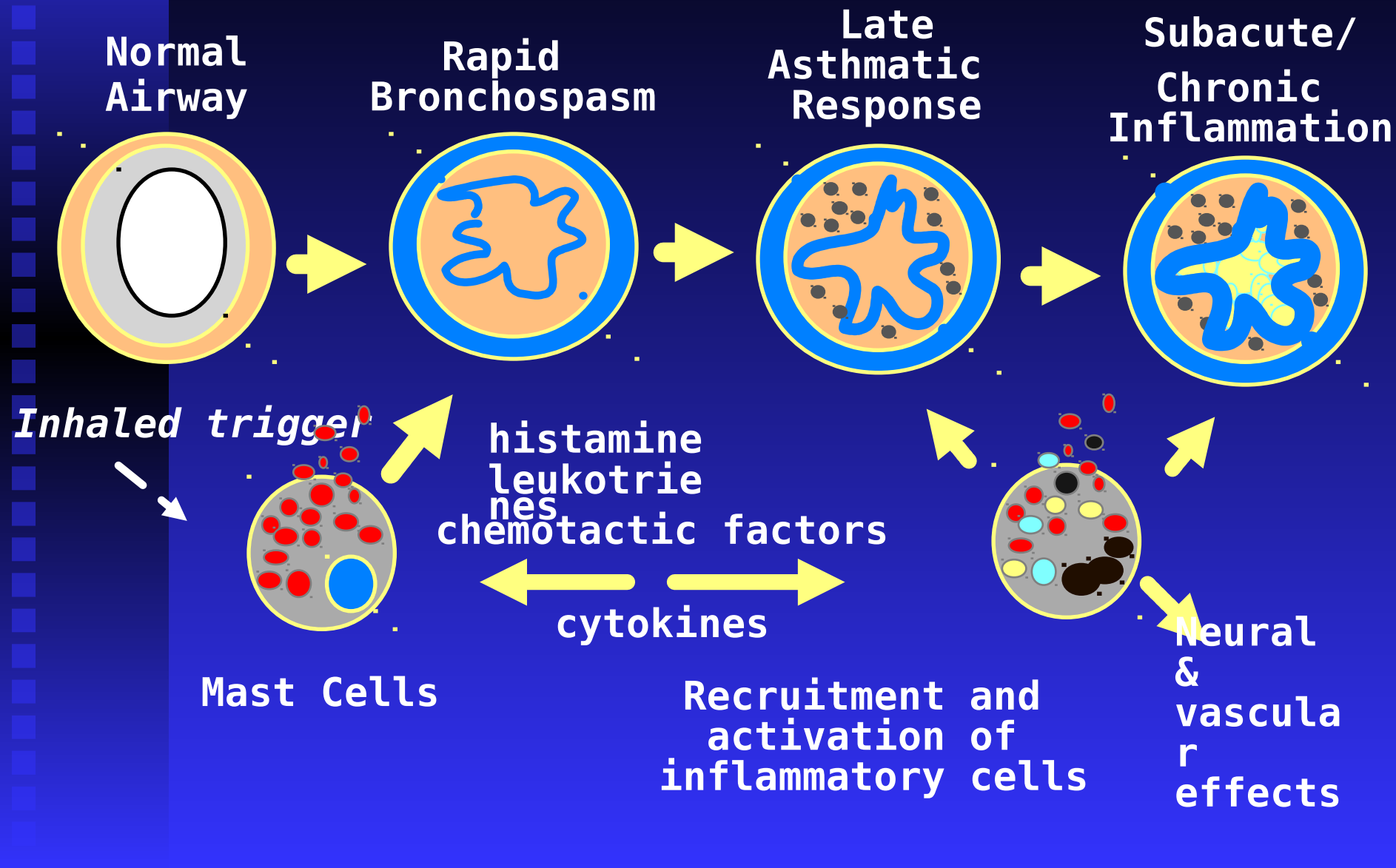
Asthma is a chronic inflammatory disease of the airways with

- Airway obstruction that may or may not be reversible, either spontaneously or with medication
- Airway inflammation caused by many cellular components
- Increased airway hyperresponsiveness

Airways: Normal vs. Asthma



ASTHMA PATHOLOGY

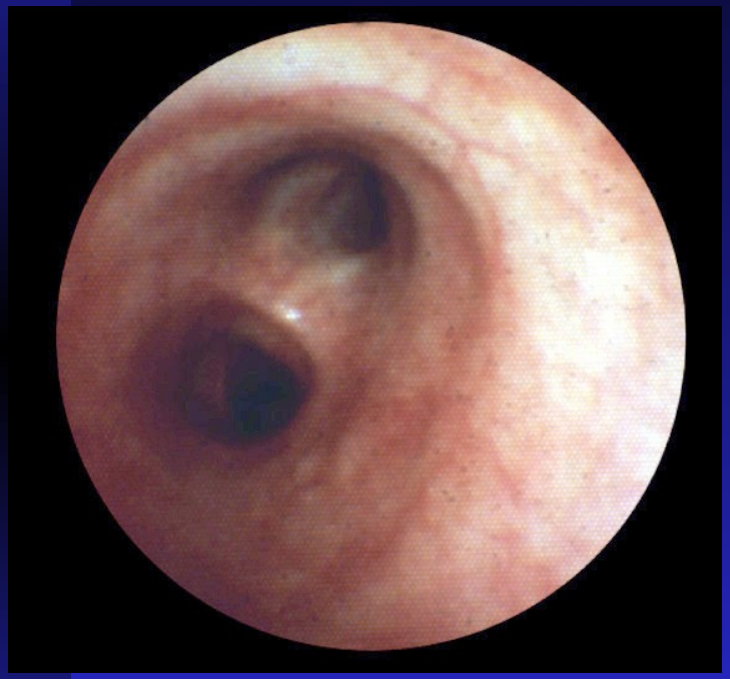


WHAT IS ASTHMA?

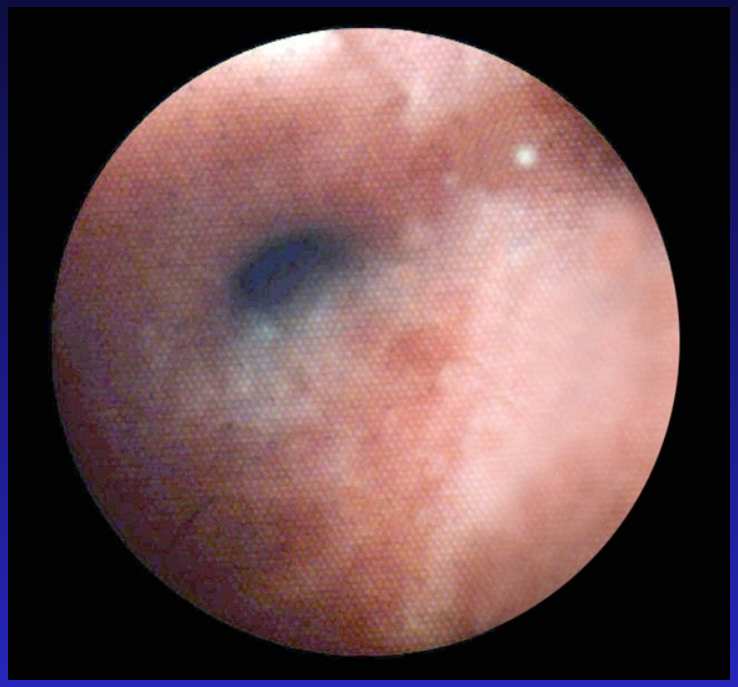
- Key Points

1. chronic, episodic, inflammatory disease
2. associated w/ a variety of symptoms
3. characterized by bronchial hyper-responsiveness
4. variable airflow obstruction

Bronchoconstriction

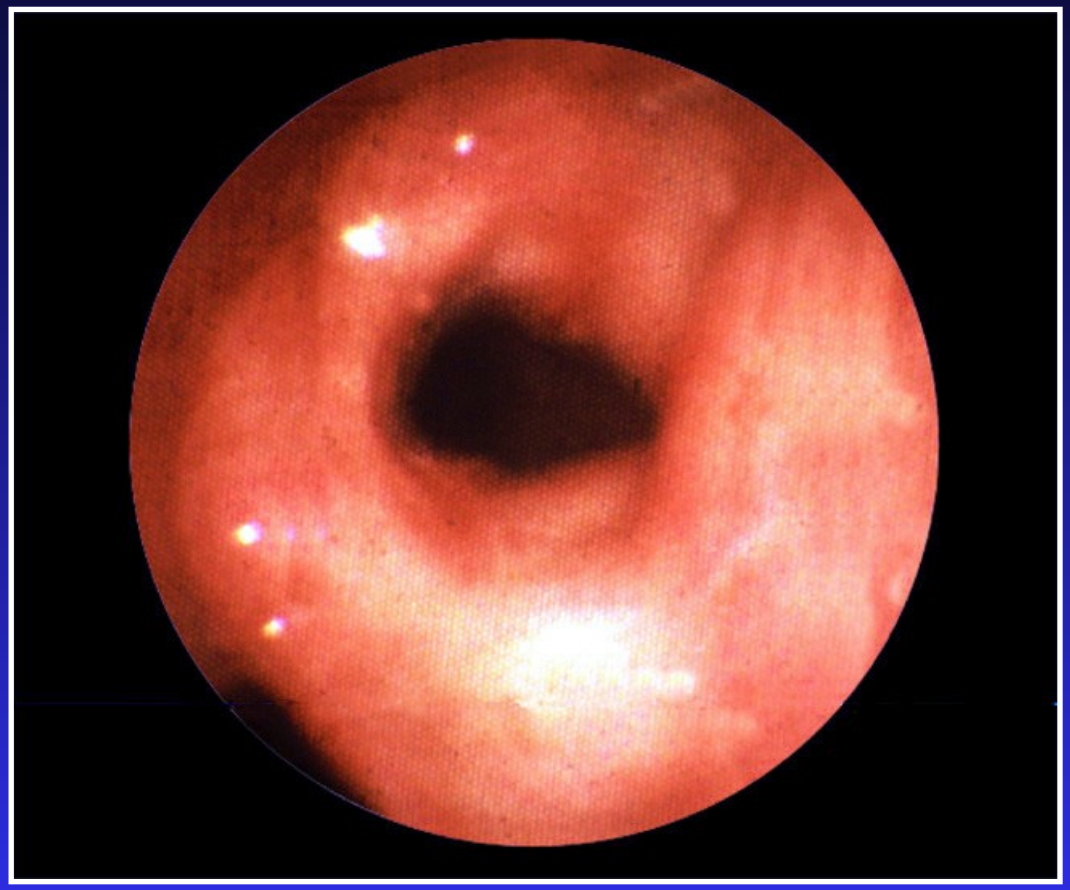


Before
Allergen Challenge

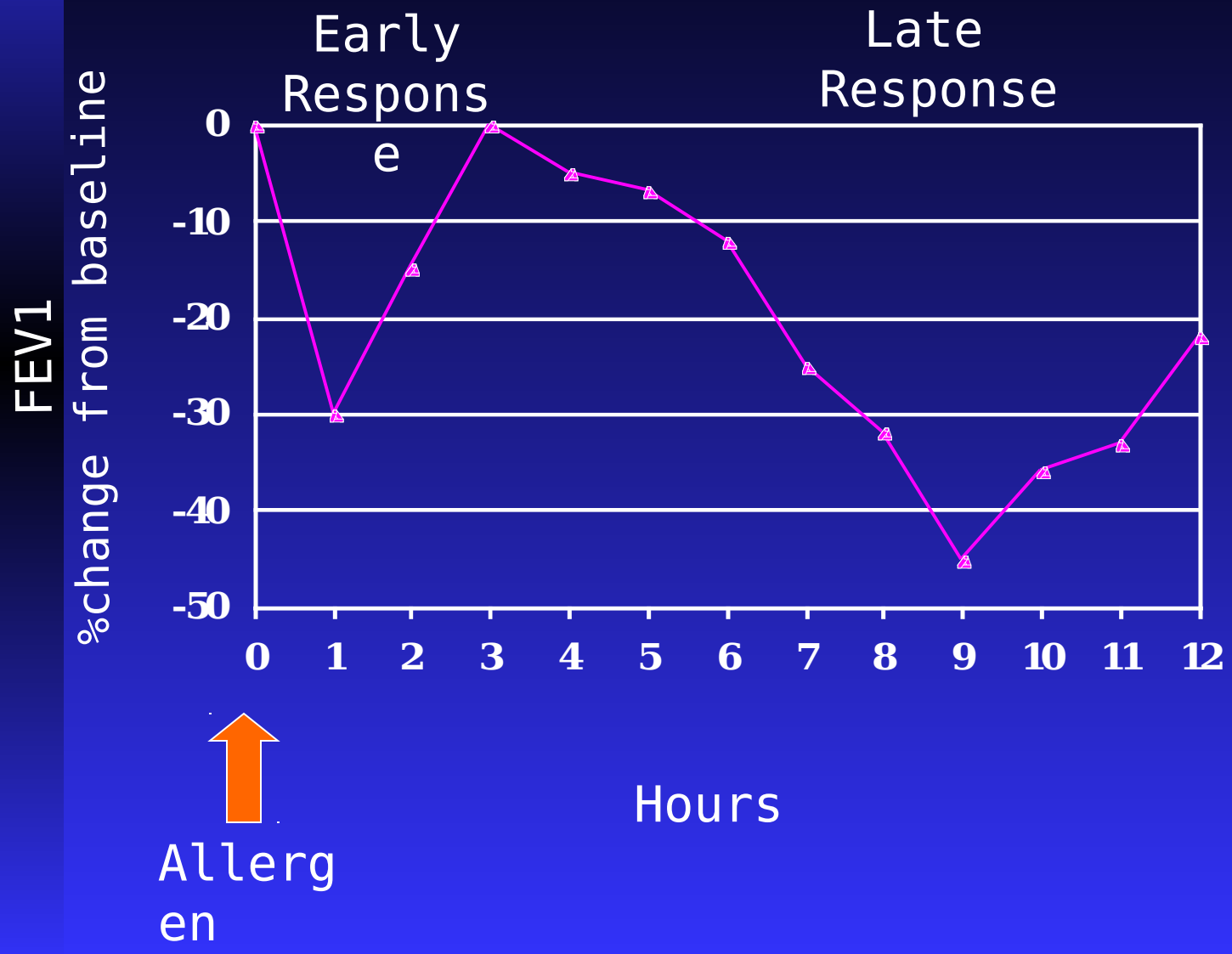


10 Minutes After
Segmental Airway
Allergen
Challenge

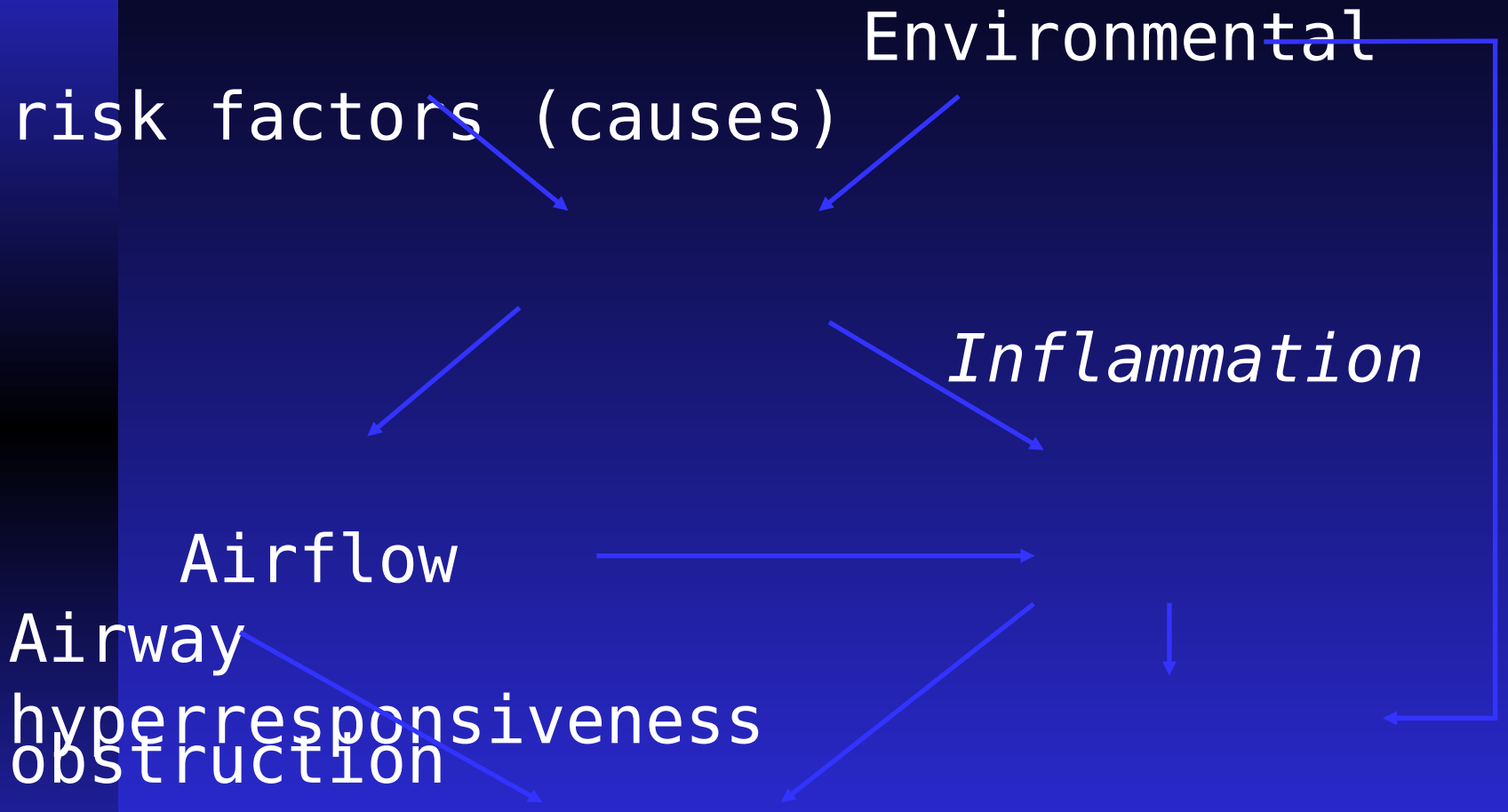
Airway Mucosal Edema



EARLY AND LATE ASTHMATIC RESPONSE



Underlying Mechanisms



Adapted from *Practical Guide for the Diagnosis and Management of Asthma.* NIH; 1997,

National Heart, Lung and Blood Institute (NHLBI) Guidelines

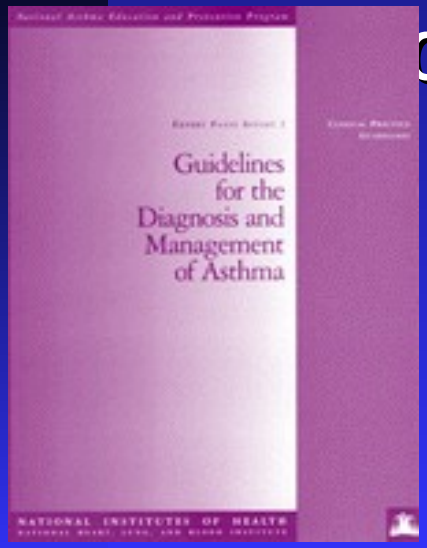
- Guidelines should be considered recommendations within the context of a provider's clinical judgment.

Background

- National Institute of Health (NIH) and Department of Health and Human Services (DHHS) join forces to create National Heart, Lung and Blood Institute (NHLBI)
- NHLBI founds National Asthma Education and Prevention Program (NAEPP) in late 1980’s

More Background

- NAEPP forms Consensus guidelines updated periodically.
  - Last review in 1997, with date[illegible]02 &



Background

- Department of Defense and Veteran's Administration join forces to create clinical practice guidelines (CPGs) for treating asthma by military physicians
  - Reflects much of the NAEPP guidelines

Asthma Classification

- NIH guidelines classify asthmatics into 4 groups based on severity
- Classification is important for physician communication and so appropriate therapy can be used based on published guidelines
- NHLBI (National Heart Lung and Blood Institute)/NIH guidelines for the diagnosis and management of asthma available online: www.nhlbi.nih.gov/guidelines/asthma

Expert Panel Report Recommendations

- Diagnose asthma
- Reduce inflammation, symptoms, and exacerbations
- Monitor and manage asthma over time
- Treat asthma episodes (attacks) promptly
- Avoid adverse drug effects

Guidelines for the Diagnosis and Management of Asthma. NIH; 1997, publication 97-4051.

Mild Intermittent

- Symptoms ≤2Xs/week or less
- Nocturnal symptoms ≤2Xs/month
- Lung function: PEF/FEV1 ≥80% predicted
- PEF variability ≤ 20%

Mild Intermittent (continued)

- No daily medications needed.

Mild Persistent

- Symptoms ≥2Xs/week but ≤1X/day
- Nocturnal symptoms >2Xs/month
- PEF/FEV1 ≥80% predicted
- PEF variability 20-30%
- These are patients with symptoms more than twice weekly (but not daily) who have normal baseline spirometry

Mild Persistent (continued)

- Preferred treatment: Low-dose inhaled corticosteroids
- Alternative treatment: cromolyn, leukotriene modifiers, nedocromil

- Low dose inhaled steroids are usually sufficient in this group
- If not controlled with the above, the patient is behaving more like a moderate persistent patient

Moderate Persistent

- Daily daytime symptoms
- Nocturnal symptoms ≥1X/week
- PEF/FEV_1 ≥60% - ≤80%
- PEF variability ≥30%

Moderate Persistent (continued)

- Preferred treatment: Low dose inhaled corticosteroids and long-acting beta$_2$ agonists OR medium dose inhaled corticosteroids.
- Alternative treatment: Low dose inhaled corticosteroids plus leukotriene receptor agonist or theophylline.

Severe Persistent

- Continual daytime symptoms
- Nocturnal symptoms frequent
- PEF/FEV_1 ≤60% predicted
- PEF variability ≥30%
- A detailed investigation for causes of difficult to treat asthma should be undertaken by a specialist

Severe Persistent

- Preferred treatment: High-dose inhaled corticosteroids AND long-acting inhaled beta-2 agonists AND oral corticosteroid tablets or syrup long term (2 mg/kg/day, generally do not exceed 60 mg/kg/day)
- Consider referral

Classification by Severity (2002)

Classification	Days With Symptoms	Nights With Symptoms	PEV* or FEV_1†	PEF‡ Variability
Severe persistent	Continual	Frequent	≤ 60%	> 30%
Moderate persistent	Daily	> 1 night/wk	> 60 to < 80%	> 30%
Mild persistent	> 2/wk but < 1x/d	> 2 nights/mo	≥ 80%	20–30%
Mild intermittent	≤ 2 d/wk	> 2 nights/mo	≥ 80%	< 20%

*PEV = peak expiratory volume; †FEV_1 = forced expiratory volume in 1 second;
‡PEF = peak expiratory flow.

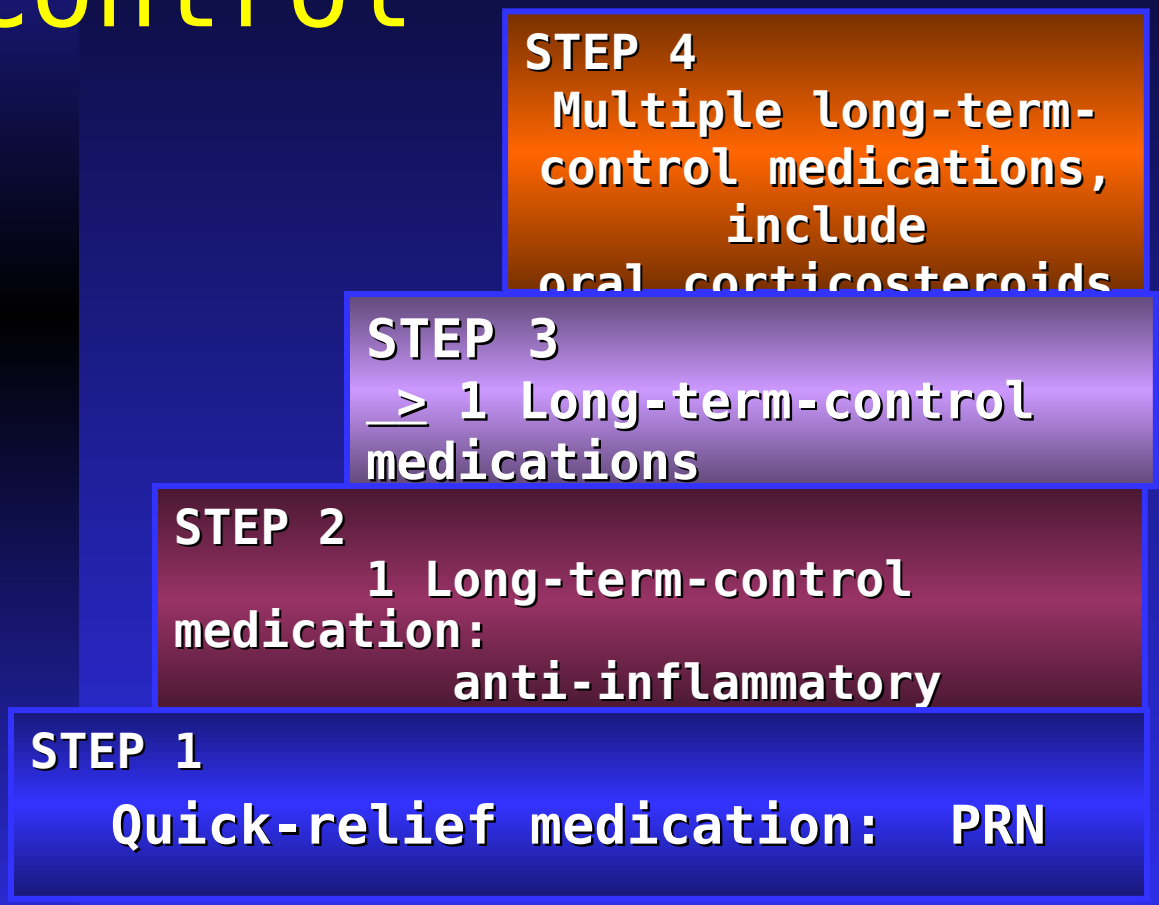
Guidelines for the Diagnosis and Management of Asthma. NIH. 2002.

2002 Expert Panel Update: Pediatrics

- Long-term-control therapy is preferred; consider in infants and young children if they
  - Experience 3 episodes of wheezing in 1 year, lasting >1 day and affecting sleep *and*
  - Have risk factors for asthma development:
    - Parental history of asthma or diagnosis of atopic dermatitis *or*
    - Two of the following: diagnosis of allergic rhinitis, wheezing apart from colds, peripheral blood eosinophilia
- The above are in addition to the previous recommendations to begin therapy when symptomatic treatment was needed more than twice a week or severe exacerbations occurred < 6 weeks apart

Guidelines for the Diagnosis and Management of Asthma—Update on Selected Topics. NIH; 2002, publication 02-5075.

Stepwise Approach to Therapy: Maintaining Control



- Step down if possible
- Step up if necessary
- **Patient education required at every step**
- Environmental control
- Recommend referral to specialist at Step 4; consider referral at Step 3

A clear need exists for better asthma management

Why Treatment Goals Are Not Being Achieved

- Different perception of what constitutes good asthma management between patients and physicians
- Poor understanding of indicators of control
  - Focus on too few variables (eg. FEV1 only)
  - Failure to appreciate the full impact of asthma on multiple aspects of patients' lives
- Persistent symptoms despite medication use
  - Variability of response to treatment
- Poor adherence to treatment regimens

Problems w/ Current Therapy for Asthma

- Lack of recognition that asthma is a chronic disease, not an acute one
- Complexity of medication routines
- Provider who is providing treatment
- Undertreatment of children

Clinician-related Barriers

- Provider's knowledge of disease
- Appointment schedules/ time constraints
- Multiple providers
- Perceived clinician disinterest

Asthma Management Program

- Goal is to improve quality of life
- 6 goals of asthma therapy
  1. Minimal or no chronic symptoms day or night
  2. Minimal or no exacerbations
  3. No limitations on activities; no school/ work missed
  4. Maintain (near) normal pulmonary function.
  5. Minimal use of short-acting inhaled beta-2 agonist.
  6. Minimal or no adverse effects from medications.

Achievement of Goals vs Reality

Goal	Reality
No missed work or school	49% of children and 25% of adults missed school or work due to asthma
No sleep disruption	30% of patients reported nocturnal awakenings at least once a week
Maintenance of normal activity	48% report that asthma interferes with recreation; 36% with normal physical exertion; 25% with social activities
No (or minimal) need for emergency department visits, hospitalizations, or other unscheduled office visits	32% of children and 19% of adults required emergency department visits; 55% of children and 36% of adults had unscheduled office visits
Normal or near-normal lung function	35% reporting having had a lung-function test in the past year; 28% have peak flow meters; 9% report using them at least once

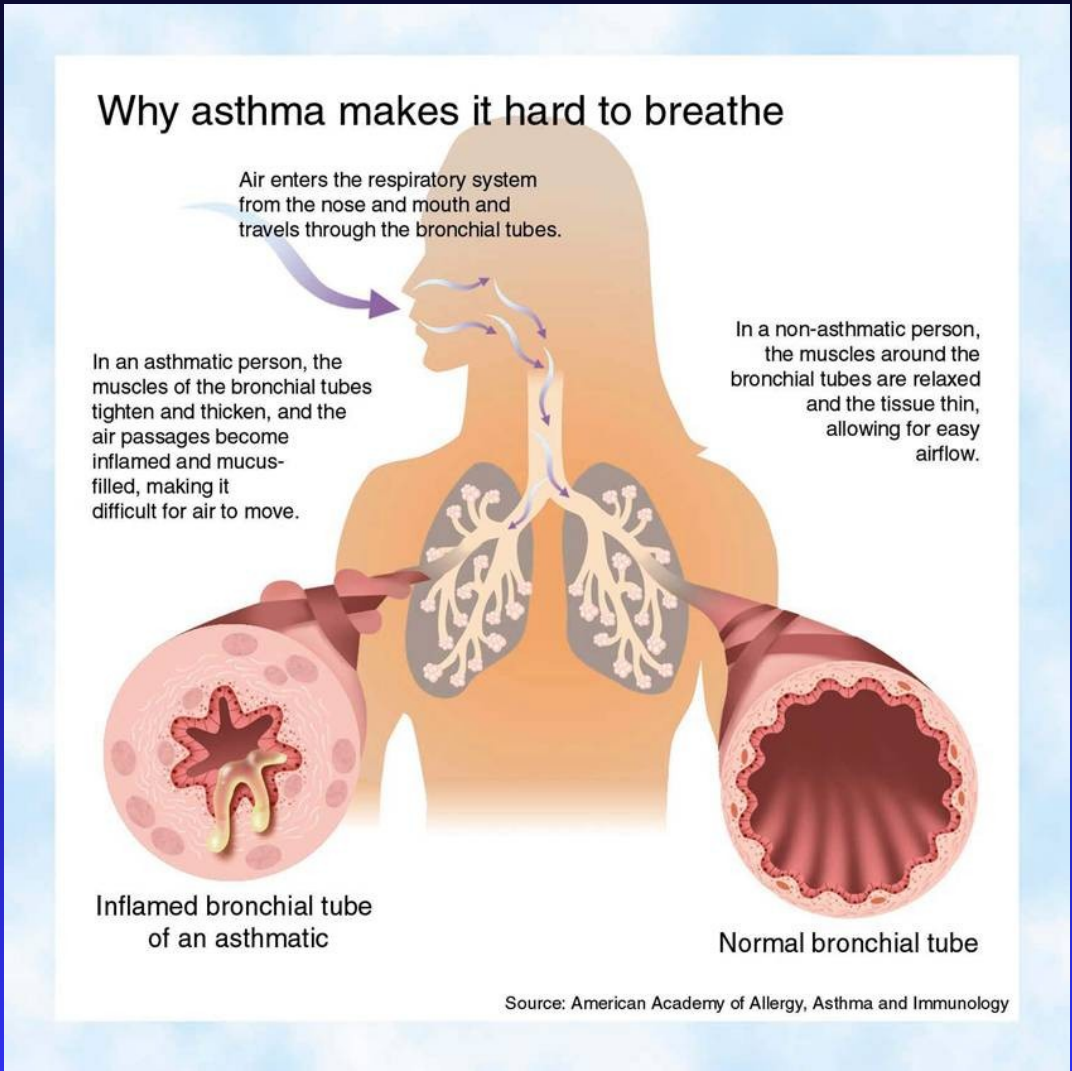
Components of Asthma Care Management

- Provide health care providers with tools
  - Evidenced based guidelines/ clinical pathways
  - Protocols for inpatient, outpatient & emergency department encounter
  - Education in asthma management
  - Lectures, workshops and problem-based learning sessions
  - Data reflecting outcome measures

Components

- Provide health care providers w/ resources to educate patients in aspects of asthma care.
- Age appropriate basic skills & handouts
- Asthma education classes
- Local & national asthma resources

WHAT IS ASTHMA?


Why asthma makes it hard to breathe
Air enters the respiratory system from the nose and mouth and travels through the bronchial tubes.
In an asthmatic person, the muscles of the bronchial tubes tighten and thicken, and the air passages become inflamed and mucus-filled, making it difficult for air to move.
In a non-asthmatic person, the muscles around the bronchial tubes are relaxed and the tissue thin, allowing for easy airflow.
Inflamed bronchial tube of an asthmatic
Normal bronchial tube
Source: American Academy of Allergy, Asthma and Immunology

Diagnosing Asthma

- Diagnosing asthma is based on:
  - History
  - Physical exam
  - Diagnostic tests (PFTs)

Diagnosis

Findings that increase the probability of asthma include

- Episodic cough, wheeze, chest tightness, shortness of breath; **cough can be the sole symptom**
- Symptoms worsen in presence of aeroallergens, irritants, or exercise
- Symptoms occur or worsen at night, awakening the patient
- Presence of allergic rhinitis, atopic dermatitis
- Family history of asthma, allergies, rhinitis, sinusitis

Children have Persistent Asthma if The "RULES OF TWO"™* Applies…

- Use a rescue inhaler more than 2 times per week
- Awaken at night due to asthma more than 2 times per month
- Refill a rescue inhaler prescription more than 2 times per year©

*"RULES OF TWO"™ is a trademark of the Baylor Health Care S

Asthma History

- Patient's symptom history
  - Daytime symptoms
  - Nighttime symptoms
  - Symptoms while exercising
- Number of times patient has needed quick-relief medications
- Emergency room visits or hospitalizations
- Missed days from school or work
- Ability to maintain normal activity levels

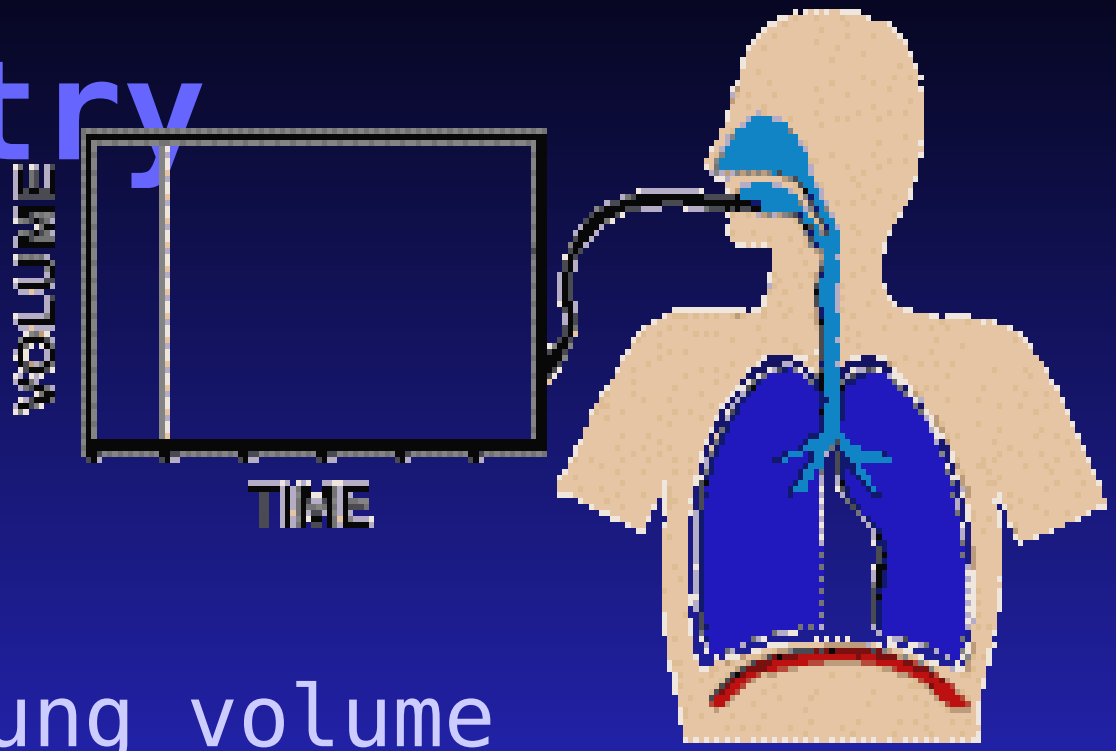
Physical Exam

- Wheezing during normal breathing, prolonged expiration
- Signs of rhinitis, nasal swelling or polyps, sinus drainage
- Signs of allergic skin disease
- Abnormal chest shape; use of accessory muscles

When Should Wheezing be Called “Asthma”?

- When wheezing becomes recurrent
- When other wheezing conditions have been excluded
- When a number of known risk factors are present
- When the child responds to anti-asthma therapy

Spirometry



Measures lung volume and flows

SPIROMETRY VS PEAK FLOW

- Spirometry is used to diagnose asthma & peak flow readings is used to monitor.
- Airflow in the small airways is more accurately measured w/ spirometry than with peak flow

Spirometry

- FVC: how much air can you can force out after max inspiration (forced vital capacity).
- FEV_1: how much air you can breathe out in the 1st second of forced exhalation (forced expiratory volume in 1 second)

- FEV less than 80% of predicted = asthma
- FEV increase by 12% or more post bronchodilator = asthma

Advantages of spirometry over peak flow

- Test quality can be assured
- Measures airflow in both large and small airways
- Higher sensitivity to severity
- Revenue generation
- Meets/ exceeds national standards

Normal ventilatory function

- $FEV_{1/}$ FVC ratio more than 0.75 (adults) and 0.80 (children and adolescents)
- FVC more than 80% predicted
- FEV_1 more than 80% predicted
- FEF_{25-75} more than 60% predicted

Spirometry

- At initial assessment
- After treatment has stabilized symptoms
- At least every 1 to 2 years if asthma is stable
- When asthma is unstable
- Other times, as clinician believes needed

Peak Expiratory Flow (PEF) Monitoring in Managing Asthma

- Provides objective data to assist care provider
- Documents personal best and flow variability
- Detects deterioration in control
- Indicates the need for increasing or decreasing medications
- Aids in trigger identification

Peak Flow Method

- Ask patient to sit up straight or stand
- Hold meter horizontally – be sure marker is in “0”
- Breathe in deeply
- Seal lips around mouthpiece & breathe out as fast and hard as possible
- Record reading, return marker to “0” & repeat twice – the PEF is the “best of 3” readings
- Compare PEF w/ the predicated values chart

Personal Best

- Personal best peak flow is the best standard
- Have patient take daily readings for 2-3 weeks when not having asthma symptoms
- PEF is likely to be best in early afternoon

Reversibility test

- Measure baseline PEF & take “best of 3 readings
- Give 200-400 mcg of a β_2 agonist such as albuterol
- Wait 15 mins and then recheck “best of 3” PEF readings – an increase of 15% or more indicates reversibility & supports diagnosis

Teaching Use of Peak Flow Meters

- Tell steps and give written instructions
- Demonstrate how to use peak flow meter
- Ask patient to demonstrate using checklist
- Explain what patient did right and how to improve
- **Check technique at each visit**

Goals of Patient Education

To help patients take actions needed to control their asthma:

- Take daily medication for long-term control
- Use delivery devices effectively
- Identify and control factors that make asthma worse
- Monitor peak flow or symptoms
- Follow action plan

YOUR ROLE IN ASTHMA MANAGEMENT

- Dynamic ongoing process
- Begins at diagnosis and integrated into every step of clinical care
- Team approach
  - PCM / Nurse
  - Respiratory Therapist
  - Health Promotions Coordinator
  - Pharmacists

Patient Education

- Key teaching points

1. Basic asthma facts
2. Device skills
3. Trigger avoidance/ control strategies
4. Self management skills
   -asthma action plans
   -recognizing deteriorating control

Patient Self-Monitoring

- Recognize symptoms and know actions to take when symptoms occur
- Perform long-term daily peak flow monitoring for moderate or severe asthma or history of severe exacerbations

Promoting Adherence

- Ask patient for verbal or written agreement to take specific actions
- Follow up and reinforce with patient any actions taken at subsequent visits or calls
- Assess potential influence of patient's cultural beliefs and practices on asthma care

Promoting Adherence (cont)

- Develop an asthma action plan
- Fit daily medication into family routine
- Identify and address obstacles and concerns
- Ask for agreement or plans to act
- Enlist family involvement
- Follow up and review performance at each visit

What are Asthma Action Plans?

- Written instructions for patients on treatment and self-monitoring
- Peak flow or symptom-based plans
  - Increase patient awareness of disease state
- Developed by the clinician based on severity

Asthma Action Plans (cont)

- Guide decision-making during exacerbations
- Enhance patient/provider communication
- Assesses severity in patients with poor perception of airway obstruction
- Evaluates responses to changes in therapy

Asthma Action Plan

Asthma Action Plan

Name: _____

Doctor: _____ Date: _____

Phone for doctor or clinic: _____

Emergency 911 or: _____

My best peak flow reading is: _____

1. Green

Take control medicine every day.

Medicine | How much to take | When to take it

Breathing is good.
- No cough or wheeze
- Can work and play

Peak flow above _____

2. Yellow

Take quick-relief medicine when you have a flare-up.

Medicine | How much to take | When to take it

You are having a flare-up.
- Cough or wheeze
- Tight chest
- Waking up at night

Peak flow between _____ and _____

3. Red

Get help from a doctor now!

Medicine | How much to take | When to take it

Your asthma is not under control.
- Quick-relief medicine isn't helping
- Breathing hard and fast
- Can't walk or talk well

Peak flow below _____

Notes

Asthma Action Plans

- Teach about
  - Current medications/doses & devices
  - How to tell how you are doing
  - When to seek care

Elements of Asthma Action Plans

- Green, Yellow, Red Zones
- Peak flow or symptom based
- Self – monitoring guidelines
- Medications
- Follow up

AMERICAN LUNG ASSOCIATION®
of Washington

My Asthma Plan

Name: _____ DOB _____
Parent/Guardian: _____ Phone: _____
Doctor: _____ Phone: _____
Friend/Taxi phone: _____ **Peak Flow Personal Best:** _____
Asthma Triggers: _____
Food Allergies: _____

For school & child care medication permission: This patient has been instructed in the proper way to take his/her medications. He/she is capable of self-administering medications: Yes No He/she can reliably report asthma symptoms: Yes No

Health Care Provider's Signature: _____ Date: _____ Phone: _____

I Feel Good

- Breathing is good
- No cough or wheeze
- Can work & play

Peak Flow Number
_____to_____

Prevent asthma symptoms every day:

Medicine:	How much:	When:
_____	_____	_____
_____	_____	_____
_____	_____	_____

20 minutes before exercise or sports, use this medicine:

_____	_____	_____

I Do NOT Feel Good

- Cough or wheeze
- Difficulty breathing
- Wake up at night

Peak Flow Number
_____to_____

CAUTION! SLOW DOWN & take relief medicine:

Medicine:	How much:	When:
_____	_____	_____

ALSO CONTINUE/INCREASE your preventive medicine:

_____	_____	_____
_____	_____	_____

Call your doctor if you have these symptoms frequently or if relief medicine does not work!

I Feel Awful

- Medicine not helping
- Breathing hard, fast
- Can't talk/walk well

Peak Flow Number
_____to_____

MEDICAL ALERT - GET HELP NOW!
Take these medicines until you talk to the doctor:

Medicine:	How much:	When:
_____	_____	_____
_____	_____	_____

Call 911 if your asthma is very severe

Parent Signature: _____ Date: _____

Drawings courtesy of RAMP, Berkeley, CA

Spot poor control: yellow zone

- Deterioration of peak expiratory flow rate
- Increase in diurnal variation
- Increase in symptoms
- Increased use of bronchodilator
- Declining efficacy of bronchodilator
- Sleep disturbance
- Decrease in exercise tolerance

Yellow Zone

Caution: your asthma is getting worse. You may be coughing, wheezing, feeling short of breath. You may not be able to do usual activities or sleep. Peak flow 50-80%

	How Much	How Often
1.	Take your Quick Reliever	
2.	Continue your long-acting bronchodilator	
3.	Continue your Controller	
4.	Start taking	
5.	CALL YOUR HEALTH PROFESSIONAL TODAY	

Signs of severe asthma: red zone

- Dyspnea at rest
- Difficulty speaking in sentences/words
- Color-cyanois, pallor (abnormal blood gases)
- Tachycardia
- Peak flow ≤ 50%

Red Zone

MEDICAL ALERT. This is a an emergency. You may be coughing, very short of breath, unable to walk or talk easily. You may or may not be wheezing. Peak flow less that 50% _. Above treatments are not helping much, or not helping for very long.

Continue taking all Yellow Zone medication

Add

Call the office or 911- or go to the emergency department **NOW**.

Your role in patient education

- **Understand and respect the patient's point of view**
- **Concentrate first on simple messages that address patient concerns**

Maximize treatment plan

- Establish that you and the patient agree that there **is** a problem
  - that it is a potentially serious problem
  - that treating the problem is worth the cost and effort
- Address the patient's beliefs, needs, fears
- Clarify the barriers to care
- Empower the patient for self-management

Empower for self-management

- Trigger identification and avoidance
- Self-monitoring skills
  - Importance of symptom frequency & severity, response to treatment
  - Markers for when to seek care
- Medications
  - Bronchoconstriction vs inflammation
- Teach Asthma Action Plan
  - Confirm right meds, dose, device

Apply physiology to practice

- Asthma is a 2 phase disease:
  - **Bronchoconstriction**
  - **Inflammation**
- Correct treatment depends on matching treatment to level of severity
- Any person with persistent symptoms needs medications for both phases

Home Management: Prompt Treatment

- Patient education to recognize & treat exacerbations early
- Written action plan
- Instructions for recognizing signs of worsening asthma
- Prompt use of short-acting $beta_2$ agonists and steroids
- Monitoring response to medications
- Provider follow-up by phone or in person

Special Needs For Children

- Teach all caregivers to deliver medications
- Observe signs and symptoms carefully
- Monitor growth curves
- Be sure they can properly use their medications
- Make sure route of delivery , taste promote adherence
- Teach them about their chronic illness at age appropriate level

Special Problems for Adolescents

- Concern with body image
- Do not want to appear ill
- Denial of chronic illness
- Major problem with compliance

Key Components of Long-Term Control

- Assessment and monitoring
- Pharmacologic therapy
- Control of factors contributing to asthma severity
- Patient education for a partnership

Patient Education Summary

- Action plans/ zones
- Extra time
- Check inhaler technique
- Memory aids
- Color coding of medications
- Family member involvement
- Large print/ simple language
- Past experience cues
- Hypothetical situations
- Allowance of “errors”
- Exploration of barriers

Pharmacologic Mangagement of Asth

Long-Term Control

Quick Relief

Airway inflammation

Airway hyper-responsiveness

Bronchoconstriction

Advantages of inhaled therapy

Medications Overview

Long-Term Control

- Corticosteroids, inhaled (ICS)
- Long-acting beta$_2$ agonists
- Leukotriene modifiers
- Inhaled nonsteroidal anti-inflammatory agents
- Methylxanthines

Quick-Relief

- Short-acting inhaled beta$_2$ agonists
- Anticholinergics
- Systemic corticosteroids

Quick-Relief Medications

- Provide prompt relief of acute airflow obstruction and accompanying symptoms: cough, chest tightness, shortness of breath, and wheezing
- Medications include short-acting $beta_2$ agonists, oral steroids, and (in special circumstances) anticholinergics

What to teach: bronchodilators

Quick relief bronchodilators

- Work as bronchodilator
- Important for quick relief
- Always have handy!

Long-acting bronchodilators

- Take only every 12 hours

Optimize the treatment plan

- Well-controlled asthma should require 2 MDI canisters/year or less (1+1):
  - Check ICS refills on patients who refill short acting bronchodilators more than once a year
- “Take your asthma seriously!”

Inhaled Corticosteroids (ICS)

- Early intervention with inhaled corticosteroids (ICS) can improve asthma control and lung function
- May reduce symptoms and use of quick-relief medications
- Reduce frequency and severity of exacerbations
- Preferred treatment for persistent asthma at all levels of severity

Global Initiative for Asthma. NIH; 2002, publication 02-3659.

Guidelines for the Diagnosis and Management of Asthma—

What to teach: ICS

ICS work on inflammation

Take **every day**, with/without symptoms

- Not for rescue-take several weeks for full effect
- Provider may double dose of ICS for days or weeks when in yellow zone
- Use spacer with MDI
- Dry powder inhaler (DPI) needs no spacer
- Rinse mouth after using ICS

Addressing Steroid phobia

- ICS not the same as anabolic steroids abused by athletes
- Not addictive
- No significant side effects at proper dosages
- Growth delay of 1cm during 1st year of use; then regain growth velocity and attain adult height
- Uncontrolled asthma causes growth retardation
- ICS every day is much better than several bursts of oral corticosteroids\year

Optimize the treatment plan

- Inhaled corticosteroids are the treatment of choice in persistent asthma: daytime symptoms more than twice/week
- Try to help patients with persistent asthma symptoms to make the switch from cromolyn to low dose ICS

Long-Acting Beta$_2$ Agonist

- Onset of action varies with specific drug used
- Duration of action ≥ 12 hours
- Improves symptom scores and lung function; decreases nocturnal asthma, use of short-acting beta$_2$ agonist, number of exacerbations
- Adding to current ICS dose gives better asthma control than increasing current ICS dose ≥ twofold
- May be combined with ICS for treatment of persistent asthma
- Does not replace short-acting beta$_2$ agonist

Nials et al. *Br J Pharmacol*. 1990;99:120P.
Rabe and Chung. *Respir Med*. 1991;85:5-9.

Leukotriene Modifiers

- Small and variable bronchodilator effect
- Reduce symptoms
- Improve lung function
- Reduce asthma exacerbations

Global Initiative for Asthma. NIH; 2002, publication 02-3659.

Leukotriene Modifiers (cont)

- Less effective than low-dose ICS
- Cannot be substituted for treatment with ICS and achieve same level of asthma control
- Appropriate for add-on therapy to reduce dose of ICS in moderate to severe asthma but less effective than add-on therapy with long-acting beta$_2$ agonist

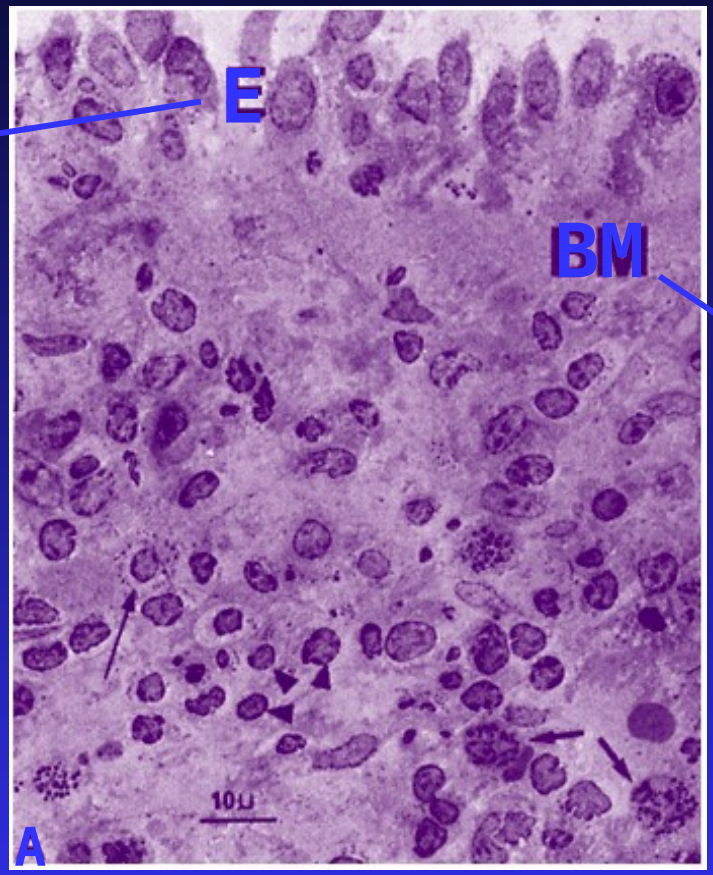
Global Initiative for Asthma. NIH; 2002, publication 02-3659.

What to teach: leukotriene receptor antagonists (LTRA)

LTRA

- Work on inflammation, although not as effective as corticosteroids
- Easy to take: pill once or twice a day
- Take every day, with/without symptoms
- Side effects usually minor if at all:
  - flu/cold symptoms, GI symptoms, ear.leg pain, thirst, urticaria

Inflammatory Cells in Lung Tissue

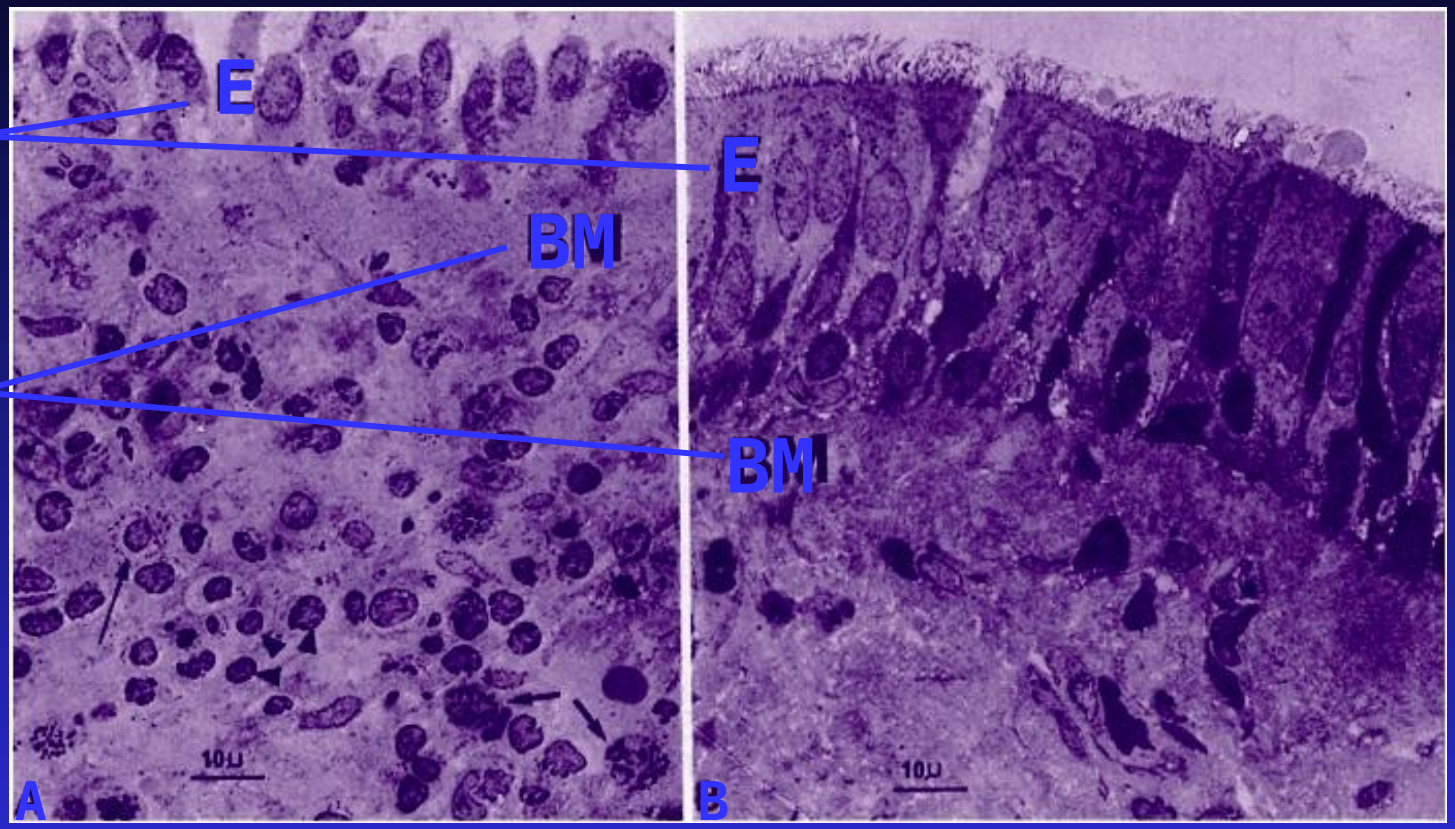


Epithelium

Basement membrane

From Laitinen et al. *J Allergy Clin Immunol.* 1992;90:32-42, with permission.

ICS Therapy: Reduces Inflammation



Before 3-Month Treatment With an ICS bid

After 3-Month Treatment With an ICS bid

Adapted from Laitinen et al. *J Allergy Clin Immunol*. 1992;90:32-42, wit

Childhood Growth and Asthma Control: Correlation

- ICSs improve health outcomes for children with persistent asthma
- Low to medium doses of ICS in prepubertal children may have the potential for decreasing growth velocity, but this effect
  - Is not sustained after first year of treatment
  - Is not progressive
  - May be reversible
- Growth of children & adolescents with asthma should be monitored

Guidelines for the Diagnosis and Management of Asthma–Update on Selected Topics. NIH: 2002. publication 02-5075.

Combination Therapy

- Long-acting beta$_2$ agonist + ICS may lead to
  - Improved lung function, reduced symptoms, and reduced supplemental short-acting beta$_2$ agonist use
  - Greater improvement than by adding a leukotriene modifier or methylxanthine, or doubling the ICS dose
- Recommended for adults and children > 5 years old with moderate or severe persistent asthma

Guidelines for the Diagnosis and Management of Asthma—Update on Selected Topics. NIH; 2002, publication 02-5075.

Inhaled Nonsteroidal Anti-inflammatory Agents

- Role in mild persistent asthma
- Inhibit early- and late-phase allergen reactions after exposure to exercise, cold dry air, and sulfur dioxide
- Reduce symptoms & frequency of exacerbations but with inconsistent benefit on airway hyperresponsiveness

Global Initiative for Asthma. NIH; 2002, publication 02-3659.

Long-term Asthma Medications

ICS	▪Reduces exacerbations ▪Improves lung function ▪Reduces airway responsiveness ▪Reduces airway inflammation	▪Increased risk of systemic adverse effects with prolonged high dosing ▪No apparent effect on disease modification
Leukotrience astagonists	▪Reduces symptoms ▪Improves lung function ▪Reduces exercise-induced bronchospasm ▪Prevents allergen-induced bronchospasm	▪Limited information on reducing airway inflammation ▪No effect on airway responsiveness
Long-acting beta2-agonists	▪Reduces exacerbation ▪Improves lung function ▪Reduces airway responsiveness ▪Attenuates exercise-induced bronchospasm	▪Reduced effect with long-term treatment ▪No effect on inflammation

NAEPP Expert Panel Report 2002 Update

Mild Intermittent

No daily medication

Mild Persistent

Preferred

Low-dose ICS

Alternative

Cromolyn, LTM, nedocromil, or SR theophylline

Moderate Persistent

Preferred

Low-to-medium-dose ICS

Alternative

ICS within medium-dose range

OR

Low-to-medium-does ICS+LTM or theophylline

Severe Persistent

Preferred

high-dose ICS+LABA

(systemic corticosteroids if needed)

ICS=inhaled corticosteroid; LTM=leukotriene modifier; SR=sustained releases; LABA=long=acting inhaled B2-agonist

Step Therapy: Gaining and Maintaining Control

- Preferred approach: start with more intensive therapy to rapidly suppress inflammation and gain prompt control
- Schedule follow-up visits every 1 to 6 months
- Gradually reduce or “step down” after several weeks or months of controlling asthma
- If control is not maintained, consider step up:
  first review patient medication technique, adherence, and environmental control

Asthma Control – Objective Measures

- Peak flow, FEV_1
- Improvement in NAEPP severity step
- Albuterol use and/or refills
- Number of days of control
- Number of exacerbations
- Frequency of unscheduled visits to ED/ urgent care center
- Frequency of hospitalization

Asthma Control – Subjective Measures

- Activity tolerance at desired level
- Sleep quality
- Symptom frequency/ severity
- Quality of life
- Sense of “being in control”

Triggers & Environmental Control

- 4 major categories of aggravating factors or triggers
  - Inhalant allergens
  - Occupational exposures
  - Irritants
  - Other

Dust Mites

To avoid these microscopic “bugs” in cloth or carpet:

- Encase mattress in dust-proof cover
- Encase pillow in dust-proof cover or wash weekly in hot water ≥ 130° F
- Wash sheets and blankets weekly in hot water
- Reduce indoor humidity to < 50%
- Do not lie on cloth-covered furniture
- Remove carpets from bedroom
- Remove stuffed animals or wash in hot water

HOUSE DUST MITE CONTROL MEASURES

- Encase the pillows & mattress in an allergen proof cover
- Wash bedding and stuffed animals weekly with hot (> 130º) water or put in hot dryer
- Reduce clutter in bedroom
- Avoid upholstered furniture

Animal Dander

To avoid these flakes of skin or dried saliva:

- Keep furred or feathered pets outdoors
- Keep pets at least out of the bedroom
- Cover air vents in bedroom to filter air
- Remove carpets and cloth-covered furniture,
  or at least keep pets out of rooms with these
  items

Cockroach

To avoid dried droppings and cockroach remains:

- Keep food out of bedroom
- Keep food and garbage in closed containers
- Use poison baits, powders, gels, paste, or traps
- If spray is used, stay out of room until odor goes away

COCKROACH CONTROL MEASURES

- Eliminate food source: Meticulous cleaning & air tight food storage
- Eliminate moisture: Repair leaks, wrap pipes & improve ventilation
- Place large bait traps in kitchen and bathroom away from children and pets

Indoor Molds

To avoid indoor molds:

- Fix leaky plumbing
- Clean moldy surfaces with a cleaner that contains bleach

Pollen and Outdoor Molds

- Keep windows closed
- Stay indoors during midday and afternoon,
  when pollen and mold spore counts are highest
- Patients with pollen allergy: consider starting
  or changing anti-inflammatory medication
  dose

House Cleaning

- Patients should not vacuum, should stay out of rooms during cleaning and for a while afterward
- Patients who must vacuum should
  - Wear a dust mask *or*
  - Use a double-layered or microfilter vacuum cleaner bag *or*
  - Use a vacuum cleaner with a HEPA* filter

* HEPA = high-efficiency particulate air.

Other Factors That May Worsen Asthma

Irritants

- Tobacco smoke
- Wood-burning or kerosene stoves
- Strong odors such as perfume and paint
- Sprays

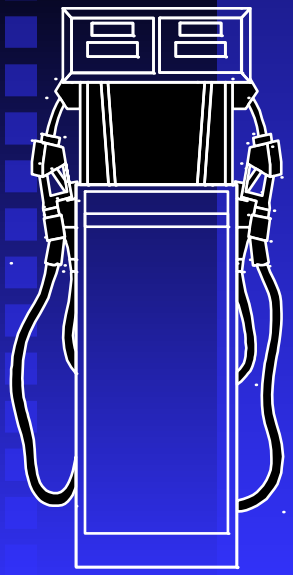
Other

- Cold air
- Other medications
- Exercise
- Sulfites

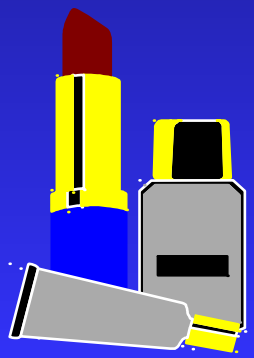
IRRIT ANTS

Tobacco smoke

Air pollution



Strong odors



Wood smoke

Ideal follow up schedule

- **Mild intermittent asthma**
  - 6-12 months and PRN
- **Persistent asthma, well controlled**
  - every 6 months
- **Persistent asthma, poorly controlled**
  - Every 2-4 weeks until well controlled
- **Severe chronic asthma**
  - Every 3 months and PRN
- **Severe acute asthma**

How to Measure Asthma Control?

Guidelines for Referral to Asthma Specialist

- Life-threatening asthma exacerbation
- Asthma therapy goals not met after 3-6 months of treatment
- Signs and symptoms are atypical
- Other conditions complicate asthma or its diagnosis
- Additional diagnostic testing is indicated
- Severe persistent asthma requiring step 4 care
- Continuous or frequent oral corticosteroids
- Under age 3 and requires step 3 or 4 care

Take the next step

- Make a difference in the care of your patients.
- Invest in your career.
- Become a leader in your practice & community
- Enroll in NRTC's management course in asthma information: www.nrtc-usa.org or 919-832-3539

Identifying/ measuring asthma management

- Outcomes
  - ORYX Data
    - Persistent asthma – education
    - Documentation of asthma severity level
    - Persistent asthma patients prescribed inhaled steroids
    - Asthma patients with spirometry documented

AHLTA

- Templates
- Action plans
- Time issues

Coding

- In 2006 the American Medical Association (AMA) identified 3 new codes for patient education
  - 98960 – education & training for patient self-management by a qualified, non-physician health care professional using a standardized curriculum, face-to-face (could include caregiver/ family) each 30 minutes for individual patient.

Coding (cont)

- 98961 – 2-4 patients
- 98962 – 5-8 patients